DESCRIPTIONS OF NEW GENERA AND SPECIES OF NORTH AMERICAN DECTICINAE

(ORTHOPTERA; TETTIGONIIDAE)

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A critical examination of the large series of North American Decticinae in the Philadelphia Collections, including the material secured by Rehn and Hebard in field work in the western United States in 1909, 1910, 1912 and 1919, as well as a number of series from other sources, has brought to light some interesting novelties. In the present paper we are presenting the descriptions of two new genera and ten new species, reserving until a future time the publication of the information we have secured on the general relationship of the genera and species of the subfamily as found in North America.

Aglaothorax segnis[1] new species. (Pl. VIII, figs. 1 and 3; pl. IX, fig 1.)

Separable from *A. ovatus* by the inflation of the meso- and metazona of the pronotal disk, the median carina of the same being more distinct caudad, the more elongate sub-elliptical pronotal disk, the less evident lateral carinae of the disk, shallower and more elongate lateral lobes of the pronotum, apical instead of preapical tooth on the inter-cercal[2] plates and the somewhat longer and more slender male cerci. From *A. armiger*, here described, it can be distinguished by the rugulose and distinctly carinate pronotal disk, the more evident lateral carinae of the disk, the more inflated pronotal mesozona, the apical tooth on the inter-cercal plates and the longer and more slender male cerci.

No relationship exists with any of the other species which have been referred to the present genus.

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[1] *Segnis*—slow and sluggish.

[2] This name is preferable to that of "infra-cercal plates" used by Caudell for the same structures, as their position and homology is better expressed by the term here used.

Type.—♂; Crestline, Lincoln County, Nevada. Elevation, 6000 feet. September 4, 1909. (Rehn and Hebard; in juniper (*Juniperus utahensis*).) [Hebard Collection, Type no. 540.]

Size medium: form robust, micropterous, with pronotum produced and cucullate, much as in *A. ovatus* (the genotype): surface smooth, of pronotum distinctly polished over numerous rugulosities.

Head well seated in the pronotum, short, deep, from cephalic aspect seen to be distinctly inflated in the ventral portion of the genae, the greatest width of the head across genae apparently greater than that across eyes; face in profile weakly convex; occiput arcuate longitudinally and transversely, regularly declivent cephalad to the apex of the fastigium: fastigia of the vertex and of the face not in contact, separated by an interspace which is triangular when seen in profile; fastigium of the vertex with the disto-lateral margins distinct and converging, when seen from the dorsum the apex is broadly blunted; dorsal surface of fastigium with a narrow, sinuate median sulcus; fastigium of the face blunt tuberculate. Eyes moderately prominent; in basal outline short ovoid. Antennae rather heavy, in length somewhat surpassing the body; proximal joint slightly broader than long, decidedly depressed.

Pronotum strongly cucullate and appreciably inflated, considerably developed dorsad of the base of the abdomen, the greatest dorsal length of the pronotum about three-fourths that of the caudal femora. In profile the dorsal outline of the pronotum is weakly concave and subsellate cephalad, distinctly and rather strongly arcuate caudad from the cephalic sulcus; when seen from caudal aspect the disk is appreciably tectate transversely. Disk of pronotum with the mesozona and metazona together ovoid in outline, the broadest point of disk at three-fifths of entire pronotal length, the greatest width contained one and one-half times in the greatest length of the pronotum, the width of disk on prozona about two-fifths of the greatest width of the mesozonal disk: cephalic margin of disk of pronotum subtruncate; caudal margin and caudal portions of lateral margins regularly semi-ovate, the lateral margins obsolete on the prozona, sharply and arcuately developed on the mesozona, thence regularly diverging to the point of greatest width of disk; lateral and caudal margins of disk thickened, substrumose on the mesozona and cephalic section of the metazona, elevated and smooth elsewhere on mesozona: median carina virtually obsolete on the prozona, weakly indicated on the mesozona and distinctly and continuously indicated on the metazona: surface of the mesozona of the disk rugulose, of the metazona arcuately bullate both transversely and longitudinally, the sculpture decided and made up of fine transversely vermiculate rugulae; a weak depressed internal channel borders the lateral carinae of the disk, this becoming more decided and much more evident caudad: transverse sulci distinct, the cephalic alone cutting the carinae. Lateral lobes of the pronotum of the deep type, without distinct humeral sinus indications, characteristic of the genus: greatest depth of lateral lobes at cephalic fifth, contained two and one-half times in the dorsal length of the same: cephalic margin of lobes sinuato-truncate, ventro-cephalic angle broadly rounded, ventral margin sinuate, ascending caudad, joining the caudal margin of the disk briefly caudad of the point of greatest width of disk; surface of lobes rugulose, the cephalic transverse sulcus deeply impressed dorsad, caudal transverse sulcus evident though less deeply impressed than the cephalic transverse sulcus; ventral margin distinctly and heavily cingulate. Tegmina in normal position completely hidden under the pronotum, of the type usual in the genus, their greatest width faintly greater than their greatest length; sutural margin with the projection at the apex of the sutural vein narrowly rounded rectangulate produced; humeral trunk very robust, strongly and regularly arcuate; stridulating vein straight transverse in the distal two-thirds, distinctly thickened near apex. Prosternum unspined. Mesosternum and metasternum strongly transverse, the lateral lobes hardly produced, broadly rounded; foraminal fossae strongly transverse, rimate.

Abdomen with a very weak medio-longitudinal carination of the dorsal tergites. Supra-anal plate, which is apparently the eleventh tergite and is fused with the tenth tergite proximad, lies between the dorsal ridges of the inter-cercal plates, the lateral margins of the plate weakly converging, nearly straight, distal margin broadly arcuate. Inter-cercal plates[3] strongly developed, weakly arcuate in most of their length, moderately falcate distad; the internal tooth apical, weakly unguiculate; dorso-internal surface of plates concavo-excavate, the dorsal carina sharp. Cerci equal to about one-third the length of the inter-cercal plates, elongate conical, proximal width equal to about one-half of length, distal extremity faintly attenuate. Subgenital plate large, scoop-shaped, subparallel laterad, distal extremity reaching to apices of inter-cercal plates, portion of distal margin between styles bisarcuate, styles represented by small semicircular rudiments.

Cephalic and median femora relatively short, moderately robust, faintly compressed, dorsal surface with a few adpressed spines proximad; ventral margins unspined, except that ventro-cephalic margin of one cephalic femur bears mesad a single spine. Cephalic tibiae with foramina rimate; dorsal margins unarmed except for a single distal spine on the cephalic margin; ventral margins with five to six spines. Median tibiae with three to four spines on the dorsal margins; ventral margins with five to seven spines. Caudal femora somewhat longer than the length of the head and pronotum together, moderately inflated proximad, dorsal surface of inflated section with numerous adpressed spines; ventro-external margin with three to six spines, ventro-internal margin with three to four spines: caudal tibiae no longer than the femora, ventral margins unarmed except for a few very small spines distad; distal spurs a single pair, the internal one appreciably longer than the external one: caudal tarsi short; plantula short, ovate in outline, the internal one the longer, this no more than one-half as long as the metatarsus.

General coloration chamois, faintly tinted with lime green on he pronotum (in life all mottled green), the dorsal abdominal pattern, which is a feature of *Aglaothorax* and *Neduba*, snuff brown, the pale blotches of the

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[3] The "infra-cercal plates" of Caudell's paper on the North American Decticinae.

same pattern cinnamon-buff. Dark annulations of antennae, dark markings of pronotal disk and dark patches on caudal femora blackish-fuscous. Head unmarked; eyes snuff brown, occasionally (paratype) blotched with fuscous; antennae with the two proximal joints pale, distad of this dark with pale annuli, the latter becoming fewer distad and distad of the proximal two or three embracing two antennal segments each. Pronotal disk with an irregularly shaped, but symmetrical, median areolate dark marking cephalad, mesad about the median carina is placed a group of irregular lineations: carinal periphery of pronotal disk with paired dark markings as follows: sub-circular blotch at cephalic transverse sulcus; sub-ocelliform blotch at caudal transverse sulcus, this with lineations extending caudad; caudad between points of greatest width with a fairly regular, closely-placed series of distinct blotches. Abdominal dorsum with a pair of distinct pale longitudinal lines, which are sinuate on the individual segments, on the fifth segment developed into a pair of large pale blotches, the whole embrowned dorsum of the abdomen with a regular sprinkling of pale "rain-drop" areolations. Cephalic and median femora each with an irregular preapical annulus of weak fuscous to saccardo's umber, this irregularly defined and with pale areolations, the median femora with traces of a dark proximal infuscation: cephalic tibiae with irregular and incompletely indicated dark annuli distad and at the distal end of the foramina; weak dark annuli distad on the median tibiae. Caudal femora with irregular and incomplete dark annuli pre-apical and disto-median in position, indicated only on the dorsal and lateral surfaces, very irregular in shape and pale areolate; portion of caudal femora proximad of disto-median dark band areolate-nebulose with buckthorn brown dorsad, the dorso-lateral portion of the same section and of the distal section of caudal femora between the dark annuli pale cinnamon-buff: caudal tibiae and ventro-external portion of caudal femora lime green to absinthe green. All tarsi and disto-external portions of tibiae washed with walnut brown, the pads margined with fuscous.

In life the specimens were very much more completely green, approximating the lime green to absinthe green tones remaining on the caudal tibiae and portions of caudal femora.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest width of pronotal disk	Length of cephalic femur	Length of caudal femur
♂, *type*.........	26.3	12.3	8.2	6.4	16.2
♂, *paratype*.....	32[4]	13.3	8.7	6.9	17

In addition to the type we have a paratypic male bearing the same data as the type.

The locality—Crestline—is one of the low points of the Juniper Mountains, which is the name used in the Report of the Death

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[4] Abdomen abnormally extended in stuffing.

Valley Expedition for the north and south plateau-like range separating Meadow Valley from the Escalante Desert. Crestline is the point at which the Los Angeles and Salt Lake Railroad crosses this divide, the elevation being approximately 6000 feet. The arborescent vegetation is an open, park-like stand of Utah Juniper (*Juniperus utahensis*) and occasional pinyon; the ground cover is almost entirely sage. The weather was chilly and unsettled when these specimens were collected. The field notes made at the time the specimens of *A. segnis* were taken are so full they are worthy of quotation in their entirety.

"The two decticids were taken in juniper. Both were located on the night of September third by their stridulations, and one was taken with the aid of a flash lamp. This individual was twenty-five feet up in the top needle clusters. Its note was much like that of *Scudderia*, but it was more difficult to locate. When found the insect started slowly to crawl downward and it could not be seized until it had gone down the trunk over a foot. The other individual was located in a juniper about ten feet high and the next morning was found resting in one of the topmost bunches of needles, where its coloration made it almost indistinguishable from its surroundings. When seized it uttered a sharp *tswick-tswick-tswick* over and over again. The song at night could be heard by intent listening at as far away as two hundred feet. Two others were heard. They began to sing as dusk fell and were at their loudest early in the evening, ceasing as the night became cold."

Aglaothorax armiger[5] new species. (Pl. VIII, figs. 2 and 4; pl. IX, figs. 2 and 3.

Separable from *ovatus* and *segnis* by the much smoother and less rugulose pronotal disk and the very weak lateral production of the lateral carinae of the pronotal disk. From *ovatus* it also differs in having the pronotal disk more elongate in proportion to the width, and in the lateral lobes of the pronotum being more shallow and more elongate caudad. From *segnis* it also differs in having the median carina of the pronotal disk subobsolete, the mesozona of same less inflated, the tooth on the inter-cercal plates pre-apical instead of apical and in the male cerci being shorter and broader.

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[5] *Armiger*—bearing a shield, in allusion to the pronotal disk.

No relationship exists with any of the other species which have been referred to the present genus.

Type.—♂; Lee Canyon, Spring Mountains, Clark County, Nevada. Elevation, 6000 feet. August 18 to 21, 1919. (Rehn and Hebard; in tree yucca (*Clistoyucca brevifolia*). [Hebard Collection, Type no. 541.]

Size and form much as in *A. segnis:* surface similar but pronotum smoother and less rugulose.

Head as in *A. segnis* but less inflated ventrad on the genae, the greatest width of the head across genae very slightly greater than that across eyes, the outline of genae from cephalic aspect moderately arcuate, instead of appreciably diverging ventrad, as in *A. segnis:* interspace between the fastigia of the vertex and of the face broader and shallower than in *A. segnis,* when seen in profile: fastigium of the face very low and very blunt.

Pronotum with greatest dorsal length about three-fourths of the length of the caudal femora. In profile the dorsal outline of the pronotum is nearly straight cephalad, moderately arcuate-decurved caudad; when seen from caudal aspect distinctly arcuate transversely on disk. Disk of pronotum with the mesozona and metazona elliptic-ovate in outline, the broadest point of disk very faintly caudad of middle of same, the greatest width contained one and two-thirds times in the greatest length of pronotum, the width of disk on prozona about three-fifths of the greatest width of same on mesozona: cephalic margin of disk of pronotum subtruncate; caudal and distal portions of lateral margins of disk semi-ovate, the lateral margins obsolete on the prozona, distinctly and arcuately developed on mesozona, but less sharply so than in *A. segnis,* on metazona less strongly arcuate laterad than in *segnis,* there non-strumose and hardly thickened: median carina obsolete on the prozona, subobsolete on the mesozona and very weakly indicated and not appreciably elevated on the metazona: surface of the disk with microscopic transverse vermiculate etchings, but never the rugulae of *A. segnis,* the internal channel bordering the caudal margin of the disk distinct but shallow, hardly indicated along the lateral margins: transverse sulci as in *A. segnis* but less decided and smoother. Lateral lobes of pronotum of the type found in this genus: greatest depth of lobes at cephalic fifth, contained two and two-thirds times in the dorsal length of the same: cephalic margin of lobes truncate, ventro-cephalic angle obtuse, ventral margin descending in cephalic fifth, there rounded obtuse-angulate, the margin thence obliquely ascending, straight, to the distal fourth, where it is weakly concave: surface of lobes but weakly rugulose, the transverse sulci but weakly impressed, the caudal sulcus not appreciably interrupting or even severing the lateral carinae of the disk. Tegmina as in *segnis.* Sternal parts as described in *A. segnis.*

Abdomen as described for *A. segnis,* with the following differences: supra-anal plate or eleventh tergite, which is apparently fused with the tenth tergite, broader than in *segnis,* the lateral and caudal margins nearly semicircularly arcuate. Inter-cercal plates much as in *A. segnis*, but the internal tooth is robust and pre-apical, the apex of the plate blunted. Cerci about one-fourth as long as the inter-cercal plates, short conical, proximal width equal to three-fourths of their length, distal extremity very faintly attenuate.

Cephalic and median femora short, robust, appreciably compressed, dorsal surface with scattered adpressed spines, these usually proximad; ventro-cephalic margins with a single spine, ventro-caudal margins unspined. Cephalic tibiae with foramina rimate; dorsal margins each with a single distal spine, also one spine placed mesad on the dorsal surface faintly distad of the foramina; ventral margins with five to six spines. Median tibiae with three to four spines on the dorsal margins; ventral margins with six to seven spines. Caudal femora somewhat longer than the combined length of the head and pronotum together, moderately inflated proximad, the inflated section dorsad with scattered adpressed spines; ventro-external margin with seven to ten spines, ventro-internal margin with three to four spines distad; caudal tibiae subequal to femora in length, spines and spurs as in *A. segnis*, caudal tarsi as in *segnis*.

Allotype.—♀; same data as type. [Hebard Collection.]

Differing from the features of the male (type) description in the following:

Pronotum in profile with the dorsal outline weakly but regularly arcuate, when seen from caudal aspect the disk is less strongly arcuate and more deplanate transversely than in male. Disk of pronotum with greatest width contained one and one-half times in greatest length of same, the width of disk on prozona about one-half of greatest width of mesozonal disk: median carina of pronotal disk more evident than in male, but less evident than in male of *A. segnis*, surface of disk with vermiculate etchings faintly more evident than in male. Lateral lobes of pronotum faintly deeper proportionately than in male, the greatest depth contained two and one-third times in the greatest dorsal length of same: ventral margin of lobes more broadly arcuate cephalad than in male, caudad the same margin is hardly at all concave; lateral carinae of disk appreciably overhanging the dorsal section of the lateral lobes. Tegmina undeveloped.

Abdomen with the production which we assume to be the eleventh tergite, and which is the supra-anal plate, somewhat narrower and more produced trigonal than in the male, the lateral margins straight converging to the acute apex. Inter-cercal plate short, broad, hardly surpassing the apex of the eleventh tergite, meeting ventrad on the median line, rounded distad, completely excavate on their internal faces. Ovipositor heavy, falciform, elongate, in length but slightly shorter than the caudal femora, gently narrowing in proximal half, thence subequal in depth to near the acute apex; dorsal margin of ovipositor with distinct, erect teeth in distal half, ventral margin with shorter, more serrate teeth in distal fifth, series of teeth on disto-ventral margin of dorsal valves less extensive than the regular ventral series. Subgenital plate broad proximad, narrowing distad, there produced into a pair of sub-parallel spiniform fingers, as long as the proximal section of the plate, when the ovipositor is in the usual resting position the fingers lie on each side of its ventral ridge; interspace between the fingers slightly widening proximad, the bottom of the interspace biconcave.

Coloration much as described in *A. segnis*, the pattern, however, with greater depth and contrast in all but the most recessive type individuals. General pale color of the head, thorax and sides of abdomen ranging from cream-buff in the recessive individuals to honey yellow in the intensive specimens; pale color of the dorsum of the abdomen ranging from cartridge buff to light pinkish cinnamon, the median bar on the dorsum of the abdomen ranging from clay color to russet. Eyes buckthorn brown to chestnut brown. Dark pattern of pronotal disk blackish fuscous; in the recessive type this is limited to a median and paired lateral touches at the cephalic transverse sulcus and a median cloud at the cephalic margin, and spaced maculations about the caudal margin of the same, this augmenting by extension and fusion of the spots, and extension of a center of infuscation at the principal transverse sulcus, until in the intensive condition we have the prozonal portion with a nearly solid blotch, the vicinity of the principal transverse sulcus with three infuscation centers, from which caudad on the metazonal disk irregular lineations extend to the nearly solidly infuscate caudal margin. Lateral lobes of pronotum with the cingulate margin regularly ticked with fuscous, the surface with scattered small substrumose nodes of whitish. Abdomen with the sides weakly washed with fuscous over the pale ground color, which shows through in very numerous areolations, producing a similar but much more evident pattern than the nodules on the lateral lobes of the pronotum. Dark pattern on dorsum of abdomen blackish fuscous, the median bar, described above, areolate much like the sides, the bar occasionally infuscate. Limbs with the markings, as found in *segnis*, infuscate, very evident in all but the most recessive specimens.

One male specimen has the sides of the abdomen and the lateral lobes of the pronotum rather weakly washed with oriental green. This condition is exactly as in nature, while the other specimens in life had no green evident.

Measurements (in millimeters)

	Length of body (exclusive of ovipositor)	Length of pronotum	Greatest width of pronotal disk	Length of cephalic femur	Length of caudal femur	Length of ovipositor
♂, *type*	24.7	12.4	7.2	6.7	17.5	. . . .
♂, *paratype*	22.6	12.3	7.6	6.3	17.2	. . . .
♂, *paratype*	26.5	14.1	8.4	7.3	19.4	. . . .
♀, *allotype*	26.3	14	9.2	8.1	20.8	18.6
♀, *paratype*	24.3	11.7	7.5	6.9	17.7	18.4
♀, *paratype*	24.5	12.7	8.4	7.5	19.6	19.5

In addition to the type and allotype we have before us a paratypic series of fifteen males and sixteen females bearing the same data as the type, and two paratypic males having the same locality and date, but taken at 4000 feet elevation. This series shows considerable variation in the size of the individuals and in the intensity of the color pattern. The males from four thousand feet elevation, in a distinctly more arid section, subject to more intense heat and light, show the maximum recessive color type, approached to some extent, however, by several males from six thousand feet. The pronotal disk shows some variation in general form in both sexes, being somewhat broader in proportion in some individuals than in others, but in even the broadest specimens we find no confusing approach to *A. ovatus*, while the sculpture shows virtually no variation. In certain females the teeth of the dorsal margin of the ovipositor cover less of the margin than in the allotype. The sulcus of the fastigium of the vertex is more extensive cephalad in some specimens than in others, and in these the fastigium is distinctly emarginate cephalad when seen from the dorsum.

The distal spine on the dorso-cephalic margin of the cephalic tibiae is occasionally absent, as is also the spine near the foramina. The median tibiae occasionally have as few as a single spine on the dorso-cephalic margin. The caudal femora may have as few as three or as many as ten spines on the ventro-external margin, and be from unarmed to having as many as five spines on the ventro-internal margin.

This species is almost entirely restricted to the tree yucca or "Joshua Tree" (*Clistoyucca brevifolia*) belt found on the northeastern slope of the Spring or Charleston Mountains in Clark County, southern Nevada. The tree yucca begins to be scatteringly evident on the slope of the range somewhat below the four thousand foot level, becoming more abundant, predominating the landscape, at about four thousand five hundred feet, and giving way to the junipers and pinyons in the neighborhood of the six thousand foot contour. Our field notes on this species are as follows: "*Aglaothorax* colonies found in joshuas and in one large cedar in their midst. All were found hidden at the base of the dried leaves just below the green leaves, or at the bases of the green leaves themselves. They occurred at heights of from four to eight feet from the ground, but were most abundant at about five to six feet. All were nestled closely to the branch, as tightly as the bundles of leaves would permit, the sharp 'daggers' forming a protecting barrier. On one sultry afternoon the males were giving a short 'tzick' at very long intervals. The males protestingly and vigorously stridulated when disturbed, not only their characteristic 'tzick' but a 'bzzzz' also. Apparently they are very local, as on one occasion thirty joshuas were thoroughly examined without result, while on two adjacent joshuas, one of which was very small, ten specimens were taken."

Rehnia cerberus[6] new species. (Pl. VIII figs. 5 and 7; pl. IX, figs. 4 and 6.)

Allied to *R. spinosa* Caudell, from southern Texas, but differing in the somewhat smaller size, in the great amount of blackish coloration on the caudal margin of the pronotum, in the generally pronounced brownish color of the abdomen, in the shorter and more recurved male cerci, the basal tooth of which is much less basal in position than in *spinosa*, in the shorter and broader stridulating field of the male tegmina and in the smaller, less recurved protuberance on the seventh sternite in the female. With *spinosa* the present species forms a group well separated from the other components of the genus.

Type.—♂; Marathon, Brewster County, Texas. Elevation, 3900 to 4160 feet. August 26, 1912. (Rehn and Hebard.) [Hebard Collection, Type no. 535.]

Size medium; general form and texture as in *R. spinosa*.

Head short in length but very deep, moderately bullate, width across ventral portion of genae one and one-fifth times that across eyes, in cephalic aspect the lateral margins of the head gently diverge ventrad: face subdeplanate: fastigium strongly compressed, sublamellate, briefly sulcate proximad on dorsal surface, in profile arcuate dorsad, apex obtuse-angulate, not in contact with the subobsolete fastigium of the front. Eyes of medium size, quite prominent, appreciably projecting, semi-globose, short ovate in basal outline. Antennae very slightly more than twice the length of the body, slender.

Pronotum sellate, on the disk elevated cephalad and caudad; cephalic elevation occupying somewhat less than one-sixth of pronotal length, regularly but not strongly ascending cephalad, the elevation extending laterad along the cephalic margin of the pronotum, becoming obsolete on the lateral lobes; caudal elevation a fourth of the pronotal length, decidedly elevated, sharply differentiated cephalad and arcuate bullate in outline, extending transversely between points dorsad of tegminal insertions; profile of pronotum between cephalic and caudal elevations deplanate and straight longitudinally, regularly arcuate transversely: greatest caudal width of pronotal disk contained one and two-fifths in greatest length of same: all margins of pronotum cingulate, cephalic margin of disk weakly concave mesad; caudal margin of disk weakly arcuate. Lateral lobes of pronotum with greatest dorsal length contained one and two-fifths in greatest dorsal length of same: cephalic margin of lateral lobes oblique sinuato-truncate; ventro-cephalic angle rounded obtuse; ventral margin weakly oblique, ventro-caudal angle (which is the point of greatest depth) broadly rounded obtuse; caudal margin obliquely sinuato-arcuate, indications of humeral sinus and a similar sinuation ventrad on the same margin, weak; surface of the lobes weakly impressed dorso-caudad.

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[6] *Cerberus*, the three-headed dog at the gates of Tartarus.

Tegmina in length equal to length of head and twice that of the pronotum together, reaching to the base of the fifth abdominal tergite, of the tegminal length that of the stridulating field occupies half, the proximal half of the tegmina broad, the distal half narrowing appreciably to the apex: costal margin strongly arcuate proximad, very faintly arcuate mesad, distad moderately straight oblique to the bluntly rounded apex; sutural margin straight distad of the stridulating field: mediastine vein distinct but short, sinuate; humeral and discoidal veins fused into a very robust humeral trunk, this distinctly arcuate in proximal half, as slender as and subparallel to the median vein distad; median vein nearly straight, bent slightly before its middle, attenuate; ulnar vein furcate at proximal two-fifths of its length, the costal fork closely approaching the median vein: stridulating field of left tegmen with greatest width contained about one and one-half times in the greatest length of the same, bounded laterad by a very broad external speculum or channel, in which is faintly indicated the anal vein; stridulating vein transverse, arcuate proximad, straight distad, very robust in distal two-thirds, in transverse section rounded dorsad; speculum with greatest length and greatest proximal width subequal: speculum of right tegmen subcircular in outline, transparent: general anastomosing venation well elevated.

Wings but very faintly shorter than the tegmina, when expanded the length along the costal margin is distinctly less than length along the radiate margin, periphery of the radiate field arcuate in a quadrant, weakly sinuate distad, apex of the anterior field bluntly rounded.

Prosternum with the paired spines very elongate, acute, erect; mesosternum with the sternal lobes erect spiniform, these productions hardly shorter than the prosternal spines.

Penultimate abdominal tergite short, transverse, distal margin arcuate obtuse-angulate distad, over cercal bases produced into broadly arcuate lobes, the surface of the tergite at the depth of the median emargination transversely arcuate impressed, this flanked laterad by paired low, but erect, subtrigonal tooth-like projections: antepenultimate tergite smooth. Supra-anal plate small, trigonal, dorsal surface excavate. Cerci relatively short, broad in proximal half, there with surface subdeplanate, along internal margin with an elevated ridge, which becomes more pronounced mesad, then disappears; the internal tooth is situated mesad, deflected and decurved; distal half falciform and tapering, narrowing sharply distad of tooth and thence caliper-like; apices acute. Subgenital plate ventrad with distinct lateral and a brief median carinae, the lateral pair styliform; distal margin V-emarginate; styles distinct, short, tapering.

Femora with all ventral margins strongly spined, those of the two margins subequal in length; genicular lobes strongly bispinose. Cephalic femora a fourth longer than the combined length of head and pronotum; spines of ventro-cephalic margin six to seven in number, of ventro-caudal margin eight in number: cephalic tibiae with foramina rimate, the spines of ventral surfaces hexacentroid[7] in character, six in number on each margin, the proximal three uniform in length, the distal three decreasing in length; dorso-cephalic margin unspined, dorso-caudal margin with five spines. Median femora slightly shorter than the cephalic femora, ventro-cephalic margin with six spines, ventro-caudal margin with eight to nine spines: median tibiae with six spines on each ventral margin, the spines similar to but shorter than those of the cephalic tibiae; dorso-cephalic margin with four to five spines, dorso-caudal margin with six spines. Caudal femora equal in length to the head, pronotum and tegmina combined, rather slender, appreciably inflated proximad, ventro-external margin with eleven to thirteen spines, ventro-internal margin with eight to ten spines: caudal tibiae slightly longer than the femora, all margins spined; distal spines three paired: caudal tarsi with plantula short and rounded.

Allotype.—♀; same locality as type. September 12 to 13, 1912. (Rehn and Hebard.) [Hebard Collection.]

The features here given are those of difference from the description of the type (♂).

Pronotum slightly narrower than in male, the greatest caudal width of disk contained one and one-third times in the greatest length of the same. Tegmina with the humeral trunk proximad less thickened and less arcuate than in male; sutural margin in general straight, except for the proximal obtuse-angulation.

Penultimate abdominal tergite with the median emargination V-shaped, deep, rounding into the truncate distal margin of the segment, which is not lobate developed over cercal bases; surface of tergite relatively simple: antepenultimate tergite with very weak median carina. Cerci but slightly longer than the supra-anal plate, conical, apex acute, there faintly incurved. Ovipositor slightly longer than the body and one and one-half times as long as the caudal femora, slender, with a very faint ventral bend at proximal two-fifths, proximal portion moderately thickened, more regularly tapering in this section when viewed from the dorsum than when seen in profile; dorsal and ventral margins parallel in distal three-fourths, the dorsal margin in distal tenth obliquely arcuato-truncate to the acute apex, which is ventral in position; margins entire. Subgenital plate rather small, when seen from venter subquadrate, the distal margin shallowly emarginate, in profile the caudo-lateral angles of the plate are broadly rounded rectangulate; surface of plate compressed proximad with a distinct lamellato-carination mesad in that region, distad with a median sub-deplanation. Seventh sternite with a decided, conical, non-compressed tubercle, which is weakly hooked caudad.

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[7] That is, with spines similar to those found in species of the genus *Hexacentrus*.

Cephalic femora with five spines on the ventro-cephalic margin, seven to eight in number on the ventro-caudal margin; cephalic tibiae with four spines on the dorso-caudal margins. Median femora with five to six spines on ventro-cephalic margin and seven spines on ventro-caudal margin. Caudal femora slightly shorter than the combined length of head, pronotum and tegmina, ventro-external margin with ten to eleven spines, ventro-internal margin with eight to nine spines.

The coloration features here given have been taken only from the best preserved specimens.

General coloration of head, thorax, venter and limbs between deep chrysolite green and rainette green (Ridgway), becoming biscay green on the tegminal venation, the face with a weak ochraceous tinge. Eyes russet; antennae with the two proximal segments of the general color, remainder russet paling to buckthorn brown distad, on proximal fifth the russet segments individually are darkened distad, and occasionally the dorsal surface, when the antennae are extended cephalad, is completely blackish infuscate for a considerable distance. Mandibles with their internal face generally washed with bay; clypeus occasionally infuscate distad with bay. Pronotum with entire cingulate margin pencilled with blackish fuscous, except in contact with the pale area on the lateral lobes, where the margin is of the general color, the dark margining of greatest width cephalad on disk: opaque white maculations developed as a rather broad intermarginal bar caudad on the lateral lobes, also as a pair of elongate trigonal spots caudad on the inflated caudal section of the pronotal disk, the apices of which spots are directed toward the median line and are occasionally subcontiguous, but generally well separated by a median fuscous patch, which in the extreme intensive type completely encircles the dorsal white patches, the latter being severed from the lateral patches by a similar dark patch, which in these intensive individuals is connected with the median fuscous patch. In extremely intensive specimens the fuscous extends ventrad along the cephalic margin of the lateral white patch and marks a sharp contrast. Meso- and metapleura each with an opaque white patch, which is also indicated on their respective coxae. Tegmina with the stridulating (♂) or axillary (♀) field largely, and the greater portion of the distal section of the discoidal field with the membranous portion mummy brown to fuscous, the entire venation pencilled over this in biscay green to dull wax yellow, the dark base color in intensive specimens showing through very solidly. Wings with the base color olive-brown to clove brown, the greater portion of the surface with numerous subquadrate patches of pale dull green-yellow, these coalescing about the periphery to form there a nearly solid pale margin, the costal margin and greater portion of the proximal section of the anterior field of the pale color.

Abdomen with its dorsum varying from dresden brown (recessive) to blackish chestnut (intensive), the distal margin of all the tergites narrowly, but in intensively colored specimens strikingly, bordered with between yellow ocher and primuline yellow: cerci weakly washed with the general dorsal abdominal coloration on an ochraceous ground. Ovipositor of the general color, with the apex of the dorsal margin and distal portion of the ventral margin pencilled with fuscous. Femoral spines blackish fuscous; tibial spines black tipped, articulate tibial spines and tibial spurs similarly black tipped, but area at their insertion also infuscate, all tibial spines and spurs, exclusive of the spines of the dorsal margins of the caudal tibiae, each with a longitudinal hair-line of blackish.

Measurements (in millimeters)

	Length of body (exclusive of ovipositor)	Length of pronotum	Greatest caudal width of pronotal disk	Length of tegmen	Length of cephalic femur	Length of caudal femur	Length of ovipositor
♂							
Marathon, *type*......	35.3	7.5	5.5	17.8	12.9	27	....
Marathon, *paratype*..	33.5	7	5.1	16	12	24.3	....
Marathon, *paratype*..	37.5	8.1	5.6	19.5	13.5	28.8	....
♀							
Marathon, *allotype*..	42.5	8.5	5.8	20.9	15.4	31.7	46.6
Marathon, *paratype*..	33	7	4.7	16.7	12.6	27	44.2
Chisos Mts.[8]........	39.5	9.8	7	22.5	17.8	37.3	50.5

These measurements show that very considerable individual variation in size is present in the species.

In addition to the type and allotype we have before us eight male and six female paratypes, taken at Marathon, Texas, August 26 and 27 and September 12 and 13, 1912, by Rehn and Hebard. We have also one male taken at Hackberry Creek, Boquillas Road, Brewster County, Texas, September 2, 1912, (Rehn and Hebard); one male taken two miles north of Bone Spring, Brewster County, Texas, elevation 2720 feet, September 9, 1912, (Rehn and Hebard); one female taken in the Chisos Mountains, Brewster County, Texas, July, 1911, (H. A. Wenzel), the latter in the collection of the Academy of Natural Sciences of Philadelphia, and three females taken at Jaral, State of Coahuila, Mexico, November 1 to 3, 1909, by J. Friesser and from the collection of the Field Museum. From these records it is evident that the species ranges from the Trans-Pecos region of Texas, south over the north-eastern portion of the Mexican tableland to at least as far as southern Coahuila.

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[8] Abdomen somewhat shrunken, the specimen having been dried from liquid preservative.

The coloration of the species varies considerably in depth, distinct recessive and intensive extremes being evident in the series. The ovipositor varies somewhat in form, occasionally having a regular, although gentle, decurvature, instead of a slight bend, as in the allotype.

A critical analysis of the paratypic series shows there is much variation in the spine formulae, a condensed summary of the extremes of which is as follows:

Cephalic femora		*Cephalic tibiae*
Ventro-cephalic margin	Ventro-caudal margin	Dorso-caudal margin
4–8 (usually 6)	5–8 (usually 8)	3–6 (usually 4)

Median femora		*Median tibiae*	
Ventro-cephalic margin	Ventro-caudal margin	Dorso-cephalic margin	Dorso-caudal margin
5–8 (usually 7)	7–9 (usually 8)	3–5 (usually 4)	4–7 (usually 6)

Caudal femora	
Ventro-external margin	Ventro-internal margin
8–14 (usually 11)	7–12 (usually 9)

The spines of the ventral margins of the cephalic and median tibiae are always six in number, except for an accidental mutilation, and the dorso-cephalic margin of the cephalic tibiae is never spined.

At Marathon the species occurred in low acacia or cat's-claw. and in a sweetflowered bush growing with the acacia on the upper slopes of the low hills to the east of the town. All the specimens seen at this locality were taken. At Hackberry Creek a very few were heard along a wash in heavy and high bushes, the specimen taken having been secured, after dark, from a hackberry tree, and at a height of fifteen feet from the ground. The specimen from near Bone Spring was in a clump of mesquite on the edge of a wash and was very wary and difficult to secure. A male was heard, by Rehn and Hebard, at about twenty-five to thirty feet from the ground in the top of a solitary willow tree in a wash, at Neville Spring, Brewster County, Texas, elevation 3290 feet, on September 8, 1912.

The note of this species is much like that of *R. victoriae*, but is much sharper and louder, more like "kazít, kazít, kazít, kazít, kazít."

Rehnia sinaloae new species. (Pl. VIII, figs. 6 and 8; pl. IX, figs. 5 and 7.)

This remarkable insect forms a section of the genus *Rehnia* showing a pronounced tendency toward *Neobarrettia* Rehn, and may require a subgenus for its reception to properly express its isolated position. It is a *Rehnia*, however, as it possesses four distal spurs on the flexor surface of the caudal tibiae, has the pronotal form of the *Rehnia* type and the male genitalia, although strikingly modified, with the same general features found in the other species of the genus.

From the other species of *Rehnia* now known the present form at once can be distinguished by the very short tegmina of the male, which are composed of little more than the complex dorsal stridulating field and a narrow lateral field, the whole no longer than the head and pronotum together; while the elongate and forcipate male cerci are equally distinctive. In the female sex the form of the subgenital plate will be found distinctive, while the tegmina proportionately are as abbreviate as in the male sex. The ovipositor is shorter than in the other species, while the process of the seventh sternite is less developed than in *R. spinosa* and *cerberus*.

Type.—♂; Venvidio, Sinaloa, Mexico. August 14, 1918. (J. A. Kusche.) [Hebard Collection, Type no. 534.]

Size slightly smaller than *R. victoriae;* form similar to that of the other species but with reduced tegmina and wings: surface smooth, of head, thorax and limbs weakly shining.

Head short in cephalo-caudal length, moderately bullate, width across ventral portion of genae one and one-third times that across eyes, in cephalic aspect the lateral margins of head regularly diverge ventrad; face subdeplanate: fastigium very small, narrow, strongly compressed, finely sulcate dorsad, in profile rounded at apex and not in contact with the fastigium of the front: occiput strongly arcuate in length and breadth. Eyes prominent, broad ovate in basal outline, the juxta-antennal portion of the margin slightly flattened. Antennae about two and one-fourth times as long as body, slender.

Pronotum subsellate, not elevated cephalad, in caudal fourth appreciably ascending dorso-caudad, all margins of pronotum cingulate: greatest caudal width of disk of pronotum contained one and one-third times in greatest length of same; cephalic margin of disk weakly but distinctly concave, caudal margin of disk subtruncate mesad, broadly arcuate laterad. Lateral lobes with greatest depth contained one and one-half times in greatest dorsal length of same: cephalic margin of lateral lobes moderately oblique arcuato-truncate; ventro-cephalic angle rounded obtuse-angulate; ventral margin arcuate subtruncate, slightly oblique; ventro-caudal angle rounded obtuse; caudal margin sinuate oblique, the sinuation ventral; surface of the lobes distinctly impressed in the usual position of the humeral sinus.

Tegmina in length subequal to that of the head and pronotum, of the total tegminal length the stridulating field occupies more than three-fourths, apex of tegmina not surpassing the fourth abdominal tergite: costal margin briefly arcuate proximad, broadly arcuate distad, the portion mesad straight; apex subrectangulate; sutural margin strongly sinuato-arcuate about inflated stridulating area, distad very briefly arcuato-emarginate: mediastine vein weak and irregular; humeral and discoidal veins fused into a very robust humeral trunk, this arcuate in proximal two-thirds; median vein nearly straight, well separated from the humeral trunk in the arcuate section of the latter, fusing with this at distal third; ulnar vein furcate at distal three-fifths of length: stridulating field of left tegmen about one and one-third times as long as broad, bounded laterad by the very broad membranous channel or external speculum, the depth of which is traversed longitudinally by the weakly defined anal vein; stridulating vein straight, transverse, very robust, triangular in section; speculum with greatest length slightly greater than proximal width of same: speculum of right tegmen larger than that of left tegmen, with general form more circular. Wings falling slightly short of the tegminal apices, rounded, folded fan-wise.

Prosternum with a pair of very elongate spines; mesosternum and metasternum with the sternal lobes developed into pronounced spiniform productions as long as the prosternal spines, those of the mesosternum more acute than those of the metasternum.

Penultimate abdominal tergite very short; distal margin mesad obtuse-angulate emarginate, produced laterad of this into rectangulate projections, a distinct sulcus extending cephalad from the bottom of emargination, this and the internal margin of the triangular projections appreciably thickened and subcingulate; antepenultimate tergite with a medio-longitudinal lamellate carination; supra-anal plate small, trigonal, dorsal surface excavate. Cerci broad at base, relatively elongate and forcipate distad, tapering from proximal sixth, where the accessory tooth, found in the species of this genus, is situated, being developed as a decurved claw; median third of cercus nearly straight; distal third of cercus moderately incurved, the apex acute and weakly recurved: dorsal surface of proximal third of cerci impressed mesad, the internal margin elevated and thickened, the impression and the external section papillose. Subgenital plate elongate, the distal margin obtuse-angulate emarginate; styles relatively short and thick; styliferous pillar-like ridges decided, a medio-longitudinal carination pronounced.

Femora with all ventral margins supplied with series of numerous small spines; genicular lobes bispinose, the spines of the caudal lobe of the cephalic femora very short. Cephalic femora longer than combined length of the head and pronotum; spines of ventro-cephalic margin appreciably longer than those of the ventro-caudal margin: cephalic tibiae with foramina rimate, the spines of ventral margins hexacentroid in character, six in number on each margin, the proximal three uniform in length, the distal three decreasing in length; dorso-caudal margin with five spines, dorso-cephalic margin with one or two spines. Median femora subequal to cephalic femora in length: median tibiae with at least six pairs of ventral spines, which are hexacentroid but shorter than those of cephalic tibiae; dorsal margins each with five to six spines. Caudal femora about four-fifths as long as the body, slender, moderately inflated proximad: caudal tibiae slightly longer than the femora, all margins spined; distal spurs three-paired, the third from the dorsal surface little more than one-half as long as the second, dorsal pair nearly as long as second pair, external first and second spurs slightly shorter than their internal equivalents: caudal tarsi with plantula short, rounded.

Allotype.—♀; same locality as type. September 2, 1918. (J. A. Kusche.) [Hebard Collection.]

The features here given are those of difference from the description of type (♂).

Size somewhat larger than in male sex. Pronotum as in male, but elevation of caudal section less decided. Tegmina somewhat longer than the greatest dorsal length of pronotum, ovoid-elliptical in outline, broadly overlapping over dorsal surface of abdomen; greatest width of tegmina (flattened) contained about one and one-half times in greatest length of same, point of greatest width slightly proximad of middle: costal margin weakly arcuate mesad, more decidedly arcuate proximad and distad, the apex narrowly rounded rectangulate; sutural margin broadly arcuate: venation of all but the axillary field much as in male but the veins weaker, axillary field with three irregular oblique veins, which are connected by numerous cross-veins, the areolets thus formed very similar to those of the marginal and discoidal fields. Wings of the same structure and proportions as in the male, and therefore actually smaller when compared with the pronotum.

Abdomen with disto-dorsal tergite divided much as in the male, but the fissation extends far deeper and embraces the whole visible portion of the segment, the lateral angles of fissation not produced but rounded. Cerci relatively short, inflated and incrassate in proximal half, thence tapering rather sharply to the very slender distal section; surface papillose, with erect hairs. Ovipositor subequal to the body in length, robust proximad, becoming slender at proximal third, the margins of distal two-thirds parallel, entire, the whole weakly but appreciably decurved, apex very acute, the dorsal margin oblique truncate before apex. Subgenital plate short, subinflated, lateral halves subquadrate in lateral view, the lateral angles rounded rectangulate: median line of the plate with an elevated lamellate carina in proximal half, which mesad gives way to an impressed area with two obscure indented lines, which embrace the end of the carina; distal margin mesad with the distal margins of the lateral halves forming a U-shaped emargination when viewed from the venter, this having a very small, but similar, emargination at its very base. Seventh sternite with a median subcompressed, trigonal projection, which is more vertical caudad than cephalad.

Cephalic tibiae with four spines on dorso-caudal margin, none on dorso-cephalic margin. Median tibiae with as few as three spines on dorso-cephalic margin. Caudal femora as long as the body (exclusive of ovipositor).

Of the fair-sized series of the species before us but a small portion of the adults, i. e. four males, retain any of the original color shades, the other specimens having had these injured or destroyed by immersion in liquid preservative. The following color description is based on two of the males which have the best preserved coloration, one of these being the type.

General color lettuce green, passing to pale buckthorn brown on the abdomen (probably lettuce green in life), the dorsum of the pronotum of the male with a faint wash of the same. Eyes buckthorn brown mottled with fuscous. Antennae with two proximal joints of the general color; remainder passing from pale russet proximad to yellowish olive and then to bister. Pronotum with the cephalic margin pencilled dorsad and for a considerable distance ventrad with fuscous; caudal margin of disk and caudal section of lateral lobes with an olivaceous fuscous band, which is broadest, though not sharply defined, at the angles, narrower mesad and there including the caudal margins, on the lateral lobes quite narrow, but sharply defined and extending ventro-cephalad to the ventral margin, on the lobes the area caudad of the line reed yellow. Tegmina of the general color, certain of the principal veins pencilled in scheele's green; areolets very largely individually blotched with fuscous, the margins about the blotches occasionally pale buckthorn brown, the speculum with much fuscous. Wings pale lumiere green with a speckling of variously sized, but always rounded, dots of shining black. Cerci of the general color. Femoral spines narrowly fuscous tipped. Cephalic and median tibiae with a weak olive lake dorsal wash; caudal tibiae with a similar wash, which may become as dark as brownish olive. Tibiae with spines of ventral surface on their proximal surface having a hair-line of black and a black tip; of dorsal surface of cephalic and median tibiae with similar lines, of caudal tibiae of general color with dark tips: tarsi dresden brown (probably green in life), laterad washed with mummy brown.

Measurements (in millimeters)

	Length of body (exclusive of ovi-positor)	Length of pro-notum	Greatest caudal width of pronotum	Length of teg-men	Length of cephalic femur	Length of caudal femur	Length of ovi-positor
♂, *type*........	33.5	6.7	5	10	10.6	27.3	..
♂, *paratype*....	32.3[9]	6.6	4.9	9.6	11	27.6	..
♂, *paratype*....	25[9]	6.7	4.6	9.5	11.2	28.2	..
♀, *allotype*.....	33.2	7.7	5	8.2	12	21	33
♀, *paratype*....	37.5	8	4.7	9.5	12.5	32.7	33
♀, *paratype*....	26.5[10]	7.4	4.8	8.6	12	30.5	32

[9] Body greatly arched, and actual length in life somewhat greater.

[10] Abdomen much shrunken.

In addition to the type and allotype we have before us a paratypic series of five males and five females from Venvidio, Sinaloa, Mexico, taken by J. A. Kusche on dates between August 11 and September 2, 1918. The male specimens show variation in the extent to which the speculum is occupied by anastomosing reticulations, these occasionally uniformly occupying all of the speculum.

In one male and one female (allotype) we find one of the ventral pair of distal spurs on the caudal tibiae absent. These probably have been accidentally lost, in both cases the missing spur being absent from the external side. The type is the only specimen bearing spines on the dorso-cephalic margin of the cephalic tibiae, while the dorso-caudal margin of the same has in the series from four to five spines, generally four. The median tibiae have the spines of the dorsal surface varying from three to six on the cephalic, generally five, and three to eight, generally five, on the caudal margin.

In addition to the adults we have before us seven male and fourteen female immature specimens, taken at Venvidio, August 8 to September 2, 1918, by Kusche. The males represent the two instars preceding maturity, the females represent the three instars preceding maturity. These individuals show that in the male sex the proximal cercal tooth is well indicated in the instar preceding maturity, while in the female sex the projection on the seventh sternite is very slightly developed in the same instar.

PEDIODECTES Rehn and Hebard

1894. *Orchesticus* Scudder, (not of Saussure, 1859), Can. Ent., XXVI, pp. 178 and 180.

1916. *Pediodectes* Rehn and Hebard, Trans. Am. Ent. Soc., XLII, p. 45.

The name *Stipator* was proposed in 1900 by Rehn for *Orchesticus* of Saussure, which had been found to be preoccupied by *Orchesticus* of Cabanis. For some time *Stipator* was used for the species of the present genus, but in 1916 it was found that the genotype, *americanus* of Saussure, was a member of the genus *Atlanticus* of Scudder, described in 1894. In consequence *Stipator* fell as a synonym of *Atlanticus* and it was necessary to propose a new name for the genus of which a new species is described below. The type of the genus is *grandis* of Rehn.

Pediodectes daedalus[11] new species. (Pl. IX, figs. 8, 9, 10 and 11.)

This species, with *P. mitchelli* (Caudell) and *P. pratti* (Caudell), forms a distinctive group of the genus, striking in the heavy build, broad pronotum, short ovipositor and handsome coloration.

Nearest relationship is with *pratti*, the present species separable by its slightly less robust structure, much less contrasting transverse banding of the dorsal surface of the abdomen, strikingly darkened apices of the caudal femora and characters of the male penultimate tergite and cerci.

Type.—♂; Uvalde, Uvalde County, Texas. Elevation, 1100 feet. August 21, 1912. (Rehn and Hebard.) [Hebard Collection, Type no. 537.]

Size medium for this genus of large species, form robust, surface glossy.

Vertex as in *pratti*, one and three-quarters times as broad as first antennal joint, narrowing very strongly to the interfastigial suture. Pronotum as in *pratti*, strongly convex in transverse section, there being no carina indicated or definition of any kind between the disk and lateral lobes; caudal portion of pronotum produced, completely covering the tegmina, with caudal margin transverse, very feebly convex; lateral lobes deep with humeral sinus broad but distinct. Prosternal spines well developed.

Abdomen stout, each tergite, unlike in *pratti*, showing caudad a slight indication of medio-longitudinal carination. Penultimate tergite produced caudad in two slender, slightly decurved processes which taper to their slender apices, the intervening space very narrowly V-shaped[12], the interval between the tips of these processes about three-quarters the length of one of them. Cerci about two and two-thirds times as long as broad, shaft cylindrical, slightly inbowed, bearing internally near the apex a triangular projection[13] which terminates in a stout, slightly decurved tooth, the bulk of this portion slightly greater than that of the apical portion of the cercus, which is rather sharply conical. Subgenital plate supplied with styles two and one-half times as long as wide, the interval between these equal in length to one of the styles and acute-angulate emarginate.

Cephalic and median femora with margins unarmed except for a single small spine on the ventro-cephalic margin of one of the former (in the series rarely armed, the ventro-cephalic margin of the cephalic femora showing in individuals as many as two, of the median femora up to four spines). Caudal femora with ventro-external margin armed with none to one (in the series none to two) spines; ventro-internal margin armed with six to seven (in the series five to ten) spines. Cephalic genicular lobes of cephalic femora and genicular lobes of median femora armed with two short spines (occasionally one in the series). Caudal genicular lobes of cephalic femora unarmed (in the series rarely with one or two small, short spines). Genicular lobes of caudal femora unarmed. Cephalic femora with dorsal surface armed along the caudal margin with three spines, cephalic margin unarmed. Caudal tibia armed with three pairs of distal spurs, of which the medio-internal is the longest, as long as the full length of the metatarsus, the medio-external three-quarters as long as the medio-internal, the dorsal pair each slightly over half as long as the medio-external. Plantula over half as long as the full length of the metatarsus.

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[11] From δαίδαλος, beautifully wrought.

[12] In the type these diverge slightly, in the paratypic male they are parallel. In the series of *pratti* before us these processes are slightly over half as long and their tips are separated by an interval equal to one and one-half times the length of one of the processes, except in one specimen in which these latter dimensions are equal.

[13] In the paratypic male this projection is more elongated and slender, including the terminal tooth twice as long as the apical portion of the cercus.

Allotype.—♀; same data as type. [Hebard Collection.]

Agrees closely with male, differing in the following features. Size larger. Tegmina apparently not developed. Penultimate tergite produced meso-caudad in two small rounded projections, between which and above the small rounded supra-anal plate this tergite is rotundato- emarginate in an area deeper than broad. Cerci simple, straight, elongate conical. Ovipositor comparatively short, slightly over half as long as caudal femur, moderately and evenly upcurved, with acute apex at juncture of valves, the distal portion and margins polished, each valve distad medio-longitudinally and also along its free margin delicately carinate. Subgenital plate boxing base of ovipositor, with free margin incurved so that the plate appears angulate-emarginate mesad.

Sexes similar in coloration. Surface shining. Base coloration cinnamon-buff. Face and vertex cinnamon-buff, cheeks tinged with slate, dorsal surface of head sepia. Pronotum sepia, narrowly margined cephalad and broadly along ventral margins of lateral lobes with cinnamon-buff, caudal margin of disk narrowly blackish, this broadening on each side and filling the distal portion of the produced section of the lateral lobes. None of these markings with margin sharply defined. Underparts and limbs cinnamon-buff, the caudal femora broadly tipped with blackish brown. Exposed metanotum cinnamon-buff, median segment suffused with sepia in distal portion, with caudal margin very narrowly blackish chestnut. Tergites to penultimate tergite cinnamon-buff, heavily tinged with sepia, particularly dorsad on each side, with caudal margin of each very narrowly blackish chestnut. Penultimate tergite cinnamon-buff heavily tinged with sepia.

In the individuals of intensive coloration the occiput, major portion of the pronotum and slightly broader caudal margins of the tergites are very dark, mummy brown. In two specimens of recessive coloration the occiput and and pronotum are buckthorn brown washed laterad with olive lake, the caudal margin of the pronotum very narrowly blackish and the other dark areas correspondingly paler, except the caudal margins of the tergites, which are as contrastingly darker as in the more usual condition.

The limbs, except the dorsal portion of the caudal femora, are washed with green in occasional individuals, this decided on the ventro-proximal portion of the ovipositor in such females. The female from Del Rio, in addition to showing this feature, has a heavy blackish brown line extending along the proximal two-thirds of the dorsal surface of the caudal femora. Except for this one feature, this specimen agrees fully with the other females of *daedalus* before us.

A very different general appearance is produced in *pratti* by the unicolorous caudal femora, and the more broadly and contrastingly banded tergites and pronotum showing lighter general coloration, but which normally have the caudal margins more broadly suffused.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest width of pronotum	Length of caudal femur	Length of ovipositor
♂					
Uvalde, Texas, *type*	27.5	8.7	7.2	25.2	. . . . .
Uvalde, Texas, *paratype* . . .	28.3	8.9	7.7	26.7	. . . . .
♀					
Uvalde, Texas, *allotype*	29.8	10.2	8.8	30.3	16
Uvalde, Texas, *paratypes* . . .	28.4–31	8.7–10.2	7.9–8.7	26.2–30	15–17
Del Rio, Texas	28.2	9.6	8	28.1	16.2

In addition to the type and allotype, we have at hand one male and seven female paratypes bearing the same data, and in addition a female, taken at Del Rio, Valverde County, Texas, 1100 feet, August 23, 1912, by Rehn and Hebard. This series is in the Philadelphia Collections.

The species was found in the same type of environment at both localities, i. e., on rolling hills covered with a low sensitive-leaved acacia (*Acacia berlandieri*), various low thorny desert shrubs, occasional arborescent yuccas and two species of prickly pear cactus. The single specimen from Del Rio was taken in the sensitive-leaved acacia, in which bush the species was found fairly common at Uvalde. At that locality two individuals were also found in the Sotol (*Dasylirion* sp.), and a number were taken from a rat's nest (*Neotoma* sp.).

The environment described above proved decidedly productive, and in the *Acacia berlandieri* the then undescribed *Phaulotettix eurycercus* Hebard and other interesting species of Orthoptera were found.

Anabrus spokan[14] new species. (Pl. IX, figs. 12, 13, 14 and 15.)

The present species is readily distinguished by the presence of a weak but percurrent median carina on the pronotum, which is strongest in the caudal portion, while the disk is defined by more apparent lateral carinae which, though rounded, are well defined caudad. In addition the male cerci are distinctive, though of the same general type as developed in *A. simplex* Haldeman. Nearest agreement with *A. simplex maculatus* Caudell is shown.

Type.—♂; Sand Point, Lake Pend d'Oreille, Kootenai County, Idaho. Elevation, 2100 feet. August 2, 1909. (Rehn and Hebard.) [Hebard Collection, Type no. 536.]

Size rather small for this genus, which includes only large species; about as in *A. simplex maculatus*. Form normal, surface glossy.

Vertex slightly over twice as wide as proximal antennal joint. Pronotum strongly produced caudad, with caudal margin of disk very broadly convex, almost transverse, very similar in form to that of *simplex maculatus*, but differing signally in the following features: lateral margins of disk weak but appreciable proximad, becoming well developed in caudal half, rounded but much more decided than in *simplex*; median carina of disk percurrent, very faint in proximal portion but more conspicuous in caudal portion. The tegmina slightly surpass the pronotum, so that the heavily veined marginal area is exposed. Prosternum unarmed.

Abdominal tergites each showing a weak but distinct medio-longitudinal carina in the caudal portion, except the penultimate tergite, which is broad, with surface weakly bilobate and caudal margin transverse, showing weak concavity above each cercus, the median V-shaped portion composed of a soft pliable integument, to the caudal margin of which the triangulate shield-shaped supra-anal plate is attached. Cerci, as in *simplex* and *simplex maculatus*, dividing into two arms which, curving inward distad, are each terminated in a long sharp tooth directed inward, but, unlike that species, the external or dorsal arm is considerably over twice as long to the point of inward curvature as the internal or ventral arm. Subgenital plate with two heavy rounded carinae in distal half, which terminate in two rather elongate styles, the margin between these rounded rectangulate (varying in the series to obtuse-angulate) emarginate. Styles cylindrical, nearly five times as long as wide, showing a slight proximal decurvature.

Cephalic coxae armed with a large, flattened, triangular spine, less than twice as long as its basal width. Limbs rather plentifully supplied with minute, short hairs, the sockets of these represented by minute pits, these particularly noticeable on the dorsal surfaces of the caudal femora. Cephalic and median femora with ventral margins unarmed, except for one spine on the ventro-cephalic margin of one of the former. Caudal femora with ventro-external margin only armed with (two and three, two to nine in the series) very small, short, procumbent spines. (In the series ventro-cephalic margin of cephalic femora armed with none to three spines; ventro-cephalic margin of median femora with none to five, ventro-caudal of median with one to eight spines.) Cephalic genicular lobe of cephalic and median femora armed with two minute teeth. Caudal genicular lobe of cephalic femora unarmed. Caudal genicular lobe of median femora armed with one minute tooth (in the series sometimes none, rarely two). Genicular lobes of caudal femora unarmed (or in the series one to all supplied with a single vestigial tooth). Cephalic femora with dorsal surface armed along the caudal margin with four and five (in the series three to five) spines and along the cephalic margin with none or one (in the series none to three) spines. Caudal tibiae armed with three pairs of heavy distal spurs, of which the medio-internal is the longest, nearly as long as the dorsal length of the metatarsus, the medio-external two-thirds as long as the medio-internal, the dorsal pair each two-thirds as long as the medio-external. Plantula slightly over half as long as the dorsal surface of the metatarsus.

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[14] A branch of the Salishan Family of Indians, known as the Spokan, inhabited the region from which the present species is known.

Allotype.—♀; same data as type. [Hebard Collection.]

Agrees closely with the male, differing in the following respects. Tegmina represented by rounded pads, which are usually wholly concealed by the pronotum from above (in occasional specimens the extremities of these pads project slightly and are visible from above). Penultimate tergite much more simple but similarly formed to that of male. Supra-anal plate shorter with margins more convex than in the opposite sex. Cercus simple, elongate, conical, moderately incurved to the aciculate apex, about four times as long as its basal width. Ovipositor elongate, gently upcurved, with acute apex at juncture of valves, the distal portion and margins polished and unspecialized. Antepenultimate tergite produced ventrad on each side in a rounded area, which lies latero-ventrad before the base of the ovipositor and caudad of the lateral rounded flaps of the subgenital plate, extending as far caudad as the caudal margin of the median section of the subgenital plate.[15] Subgenital plate highly specialized (for carrying the male sperm sac) as in *simplex*; small lateral portion produced caudad on each side in rounded flaps, large median portion roughly quadrate, medio-longitudinally carinate, with caudal margin transverse and curled upward briefly, lateral margins folded inward for a decidedly greater distance, so that in caudal aspect a roughly and broadly V-shaped area is formed with the dorsal apices produced inward. The limb armament is apparently similar in the sexes.

The similarity in structure, particularly that of the pronotum, makes association of the sexes of this species an easy matter.

Surface shining. General coloration a very slightly mottled bister or chestnut brown. The produced portion of the lateral lobes of the pronotum very dark brown, the remaining ventral margin of the lateral lobes often narrowly very dark brown, in one specimen, however, much paler, tawny-olive. Face much paler, cinnamon-buff to clay color, the labral suture itself sometimes dark brown. Exposed portions of tegmina vandyke brown. Caudal femora with small blotches of blackish brown about each spine on the ventral margins. Such brown individuals show little apparent maculation, but under the microscope are seen to be finely and richly mottled.

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[15] These are referred to as the subgenital lobes of the female by Caudell in his treatment of this genus. Proc. U. S. Nat. Mus., XXXII, pp. 351–362, (1907).

A solidly green color phase is developed in this species, represented by one male and three female paratypes and a Loon Lake female before us. In this phase the green coloration is immaculate, rich bice green. The produced portion of the lateral lobes of the pronotum is vandyke brown, while the eyes, antennae, excepting the proximal joint, and all but the proximal portion of the ovipositor are buckthorn brown. The small blotches of blackish brown about each spine on the ventral margins of the caudal femora are much reduced in this color phase. The green coloration has faded somewhat, particularly on the abdomen, in the series before us.

Measurements (in millimeters)

♂	Length of body	Length of pronotum	Least width of pronotal disk	Greatest width of pronotal disk	Length of caudal femur
Sand Point, Idaho, *type*	31	10	3.3	6.3	20.8
Sand Point, Idaho, *paratypes*	26–28	9.3–9.6	3.1–3.2	5.9–6	19.2–20.7
Loon Lake, Washington	26	10.8	3.9	6.2	22.8

♀			Greatest width of pronotal disk	Length of caudal femur	Length of ovipositor
Sand Point, Idaho, *allotype*	30	9.8	5.8	22.3	23.2
Sand Point, Idaho, *paratypes*	25.5–30.5	9.2–10.3	6–6.1	22–22.6	20.8–23.6
Little Spokane River, Washington	27.3	9.5	5.2	22	21.2
Loon Lake, Washington	23–25	9.9–10.4	5.8–5.9	22	20.8–20.6

In addition to the type and allotype, we have before us three male and six female paratypes, bearing the same data, belonging to the Philadelphia Collections. We have also at hand a female, taken on the Little Spokane River, Washington, July 26, 1882, by S. Henshaw, and one male and four females taken at Loon Lake, Colville Valley, Washington, July 23 to 25, 1882, by S. Henshaw, all in the Hebard Collection ex Bruner.

The Loon Lake series shows some difference from that from Sand Point in having the expansion of the pronotum caudad less decided, with median and lateral carinae of the disk less distinct cephalad. One specimen of the Loon Lake series has the ovipositor straight.

The type series was taken in the morning of a bright day at Sand Point, Idaho. These specimens were found in a brulé about a low tangle of raspberry vines and thistles, overgrowing charred logs and stumps. The stridulation of the males was very faint for so large an insect, in fact a weak buzzing, much like that of *Conocephalus fasciatus* (DeGeer). All of the specimens were found crawling about near the ground, and were by no means as active as the individuals of *simplex* which the junior author had previously taken in the Yellowstone National Park. Neither did the present individuals appear to have nearby holes, into which to hurry when approached.

OREOPEDES[16] new genus

The present genus represents an extraordinary blending of the characteristics of other Decticine genera. The convexity of the pronotum, without carinae, suggests *Ateloplus*. The male penultimate tergite shows nearest structural resemblance to that found in *Cacopteris*,[17] though not as highly specialized. The male cerci are of a type similar to that developed in certain species of *Eremopedes*.

The decided production caudad of the pronotum, which conceals all but the caudal margins of the tegmina, and caudal tibiae lacking the dorsal pair of distal spurs, constitute other diagnostic features of value which do not occur in any of the more closely related genera.

In linear position we place this genus after *Ateloplus* and before *Eremopedes*.

The genus is monotypic. Genotype.—*Oreopedes cryptoptera* new species.

Generic Description.—Size small, form robust though moderately slender for the Decticinae. Head with vertex rather broad, narrowing rather decidedly to the fastigio-facial suture. Pronotum elongate, almost completely concealing the tegmina from above, the metanotum strongly produced caudad; disk rounding evenly into the lateral lobes, the latero-caudal shoulders subobsolete, suggesting the type developed in *Ateloplus* but very much more elongate; lateral lobes over twice as long as deep, with a broad but distinct humeral sinus, convex callosities obsolete. Tegmina in male with all but caudal margins concealed by the pronotum. Dorsal surface of male abdomen medio-longitudinally carinate. Penultimate tergite specialized, the type of specialization similar to that found in the genus *Cacopteris.* The type of specialization of the male cerci similar to that developed in certain species of *Eremopedes.* Male subgenital plate with styles very greatly reduced. Prosternum unarmed. Lobes of mesosternum and metasternum very weak. Limb armament weak. Cephalic tibiae with dorsal surface armed along external margin with three spines. Caudal tibiae armed distad with two pairs of spurs, the small dorsal pair usually found in the allied genera having disappeared, the ventral pair moved up the margin more than is usual and in consequence a greater distance from the median pair. Plantula small, longer than broad, not half the total length of the metatarsus.

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[16] From ὄρος and πηδάω, mountain leaper.

[17] We do not believe *inermis* Scudder, genotype of *Cacopteris*, to be congeneric with *californicus* Pictet (=*hermanii* Thomas), genotype of *Idiostatus*. We therefore consider *Cacopteris* a valid generic unit.

Oreopedes cryptoptera[18] new species (Pl. X, figs. 1, 2, 3, 4 and 5.)

Though insignificant in appearance, this species, when critically examined, is found to be one of the most interesting forms of the North American Decticinae. This is due to the surprising combination of characters and specialization exhibited.

Type.—♂; Silver Canyon Trail, White Mountains, Inyo County, California. Elevation, 8300 feet. September 10, 1919. (M. Hebard.) [Hebard Collection, Type no. 555.]

The following specific diagnostic characters are given, in addition to the characters stated in the generic description. Size small for the Decticinae, comparable to that of *Idiostatus callimera* here described. Form robust, but moderately slender for the Decticinae, as in the above mentioned species.

Vertex very slightly wider than proximal antennal joint. Pronotum smooth, the metazona slightly over half the total length, transverse sulci faintly indicated in dorso-lateral area only.

Penultimate tergite rather large, briefly triangularly produced caudad on each side and just within the cerci, the apices of these productions bluntly rounded, the distal margin between the productions transverse, but the surface of the plate is weakly concave in an area a triangle would occupy, the sides of which would in part be formed by the productions. Cercus about three times as long as basal width, the internal portion showing slight lamellation which increases to distal three-fifths, widening in distal half of that portion, thence narrowing more rapidly, the lamellation disappearing and the apex rather heavily and bluntly rounded; at the point of greatest width a small stout tooth occurs on the internal margin, preceded by smaller irregular teeth along the internal margin half the distance to the base of the cercus; the cercal armament is thus of a type suggesting that found in species of *Eremopedes*. Titillator represented by two very slender, moderately diverging, chitinous shafts, the external margins of which are rather coarsely serrate, the apices of these serrations directed proximo-laterad. Subgenital plate with two weakly defined, heavy carinae, which converge weakly distad to bases of styles. Styles very greatly reduced, represented by minute rounded projections not as high as wide, situated in sockets, between which the distal margin of the subgenital plate is angulate-emarginate at slightly more than a rectangle, with apex rounded.

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[18] From κρυπτὸς and πτερὰ = hidden wings.

Ventral margins of cephalic and median femora unarmed. Caudal femora with ventral margins armed with a few (one and one external and three and four internal) minute spines. Genicular lobes unarmed. Largest (mediointernal) spur of caudal tibiae nearly as long as dorsal length of metatarsus; ventral pair of spurs very small, the smaller not as large as, the larger little greater than, the larger of the marginal spines.

General coloration sayal brown, showing a microscopic and weak marbling of bister, except on disk of pronotum, where this is subobsolete, and on median portion of dorsal surface of abdomen proximad, where it is very weak. Brief visible portion of tegmina with veins cream buff and interstices bister. Abdomen with proximal tergites suffused in large lateral areas with bister, the dorsal margins of these sinuous on each side, adjacent to which the dorsal portion of the abdomen is slightly paler than elsewhere in that section. Ventral surface cinnamon-buff. Cephalic tibiae with suffusions of mummy brown at foramina and near distal extremity, traces of such marking showing distad on cephalic and median femora and median tibiae. Ventral spines of cephalic tibiae, all spines of median tibiae and proximo-ventral spines of caudal tibiae with flecks of bister at their bases. Distal tarsal joint of all limbs bister at base, tinged with this color distad.

Length of body, 18.4 mm.; length of pronotum, 5.8; length of metazona, 3.1; greatest width of pronotal disk, 2.8; total width of pronotum, 3.9; length of caudal femur, 13.2.

This interesting Decticid was found in a small area of dried yellow grass, apparently driven from sage brush, growing in an opening in the junipers. Intensive examination of the immediate vicinity failed to locate additional specimens. The locality was on the narrow summit of a ridge, somewhat above the middle section of the area of juniper and pinyon, on the western slope of the mountains. It is interesting to note that on these arid mountains the junipers and pinyons extend upward to near timber line, a weak growth of timber-line pines and scattered patches of aspen occurring above them, no distinctive forest whatever distinguishing the Canadian Zone.

Idiostatus inyo new species (Pl. X, figs. 6, 7 and 8.)

This species, though of pale and obscure coloration, is closely related to *I. callimera* here described. The most striking differences are the much more elongate caudal limbs, very weak indication of lateral carinae on pronotum, highly specialized and distinctive male penultimate tergite and similarly specialized but much longer and more slender cerci.

So weak is the definition between the disk and the lateral lobes of the pronotum in this species, that the structure shows some resemblance to the type normal in the genus *Ateloplus*.

Type.—♂; Near Owen's Lake, Inyo County, California. July, 1912. [Academy of Natural Sciences of Philadelphia, Type no. 5367.]

Size small for the genus, form slightly more slender than that of *I. inermis* (Scudder). Vertex one and three-fifths times as wide as proximal antennal joint.[19]

Pronotum smooth; disk rounding into lateral lobes so gradually that lateral boundaries of the former can not be seen except caudad, where very weak, rounded shoulders occur. Pronotum produced caudad a very short distance; lateral lobes longer than deep, the caudad margin from the rather broadly rounded ventro-caudal angle oblique and showing no humeral sinus, convex callosity at this point moderately broad, feebly convex, delimited along its internal margin by a delicate but distinctly depressed line. Tegmina of same type as found in *callimera* and *inermis*, extending beyond the pronotum a distance equal to two-thirds the pronotal length, with stridulating field exposed beyond stridulating vein. Prosternum unarmed.

Penultimate tergite produced, surface weakly bilobate, caudal margin produced in two rounded rectangulate projections, which are somewhat wider than long, with a median emargination of about equal size between, the margins of which emargination are subchitinous. Cerci with shaft moderately stout, cylindrical, nearly four times as long as their proximal width, weakly incurved, armed at end of proximal two-thirds of internal margin with an erect, sharp spine, which is nearly as long as the remaining distal portion of the cercus and is almost vertical to the shaft, tilted slightly proximad, apex of cerci armed with a small tooth, less than a third as long, which is directed mesad.

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[19] Apparently due to distortion, the vertex overhangs the face at the interfastigial suture in the present specimen.

Subgenital plate roughly scoop-shaped, with two heavy, rounded carinae converging distad to the bases of the small styles. Styles cylindrical, three times as long as wide, separated by a distance one and one-half times as long as one of them; the emarginate caudal margin of the supra-anal plate in this interval has the sides straight convergent, the basal portion, which is of slightly greater length, transverse.

Limbs with hairs as in *callimera*. Cephalic and median femora with ventro-cephalic margin armed with a single small spine. Caudal femora with ventral margins armed with (four and five) external and (three and four) internal small spines. Genicular lobes of femora unarmed, except the cephalic of the cephalic femora and the caudal of the median femora, which bear a single small spine, and the cephalic of the median femora, which bears two still smaller spines. Cephalic tibia with dorsal surface armed with three spines along the caudal margin. Caudal tibiae armed with three pairs of elongate distal spurs, of which the medio-internal is the longest, as long as the dorsal length of the metatarsus,[20] the medio-external two-thirds as long, the dorsal pair each two-thirds as long as the medio-external. Plantula about half as long as metatarsus.

General coloration ochraceous-buff, very finely marked with blackish brown around eyes and dorsal portion of internal margin of convex callosities of lateral lobes. Tegmina immaculate. Abdominal tergites with caudal margins showing very small lateral and dorsal flecks of blackish brown, and intervening dots of lighter brown of still smaller size. Cephalic and median limbs and caudal femora flecked at base of each spine with blackish brown.

Length of body, 19.5 mm., length of pronotum, 5.2; total width of pronotum, 5; length of exposed portion of tegmen, 3.7; length of cephalic femur, 5.2; length of median femur, 6; length of caudal femur, 19.3; length of caudal tibia, 20.

The type is unique.

Idiostatus callimera[21] new species (Pl. X, figs. 9, 10, 11 and 12.)

This handsome species is readily recognized by its striking coloration, the markings of the caudal femora being particularly distinctive.

The coloration of the pronotum is such that the disk appears to be sharply divided from the lateral lobes, but this is more apparent than real, the lateral carinae being well developed only in the caudal portion and much as in *I. inermis* (Scudder). We emphasize this feature as a superficial examination might easily lead one to believe these carinae to be percurrent and more sharply defined, as in *Idionotus brunneus* Scudder, than they actually are.

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[20] The metatarsus in this species is longer than in *callimera*, the longest spur decidedly longer, with shaft straighter than in that species.

[21] From καλλι-μῆρα = beautiful thighs.

The male cerci agree in type with those of *I. inyo* here described, representing a development very different from that found in any other known species of *Idiostatus.* The male penultimate tergite shows the least specialization of the known species of the genus, and consequently we would place *callimera* first in linear arrangement.

Type.—♂; Lone Pine Canyon, eastern slope of Sierra Nevada Mountains, Inyo County, California. Elevation, 8400 feet. September 8, 1919. (M. Hebard.) [Hebard Collection, Type no. 550.]

Size small for this genus, which includes very large and small forms. Form slightly more slender than in *inermis.* Vertex very slightly wider than proximal antennal joint. Pronotum smooth; disk rounding evenly into the lateral lobes except in the produced caudal portion, where distinct rounded shoulders occur, there as pronounced and slightly more sharply rounded than in *inermis*; pronotum produced caudad a short distance, the lateral lobes longer than wide, in this respect intermediate between *inyo* and *inermis*, the degree of difference being slight. Lateral lobes of pronotum with caudal margin from the rather broadly rounded ventro-caudal angle straight, oblique, then broadly convex, showing no humeral sinus; convex callosity opposite straight portion moderately broad and feebly convex, sharply delimited along its internal margin. Tegmina of same type as found in *inermis*, extending beyond the pronotum almost the full pronotal length, with stridulating field beyond stridulating vein exposed. Prosternum unarmed.

Penultimate tergite small, simple, shorter than preceding tergite, caudal margin broadly and weakly concave on each side, becoming slightly convex meso-laterad at juncture with the triangular supra-anal plate, which is three-quarters as long as the penultimate tergite, that segment with surface rather deeply concave toward base of supra-anal plate but not subchitinous. Cerci with shaft heavy, cylindrical, in length twice its basal width, dividing into a distal and internal conical projection, the projections of like size[22] and similarly with apex armed with a sharp straight tooth, bent slightly inward from the direction of the projection. Subgenital plate rather scoop-shaped, with two heavy rounded carinae converging distad to the base of the small styles. Styles cylindrical, two and one-half times as long as wide, separated by a distance twice as long as one of them; the caudal margin of the supra-anal plate in this interval transverse, showing a very feeble concavity.

Limbs moderately supplied with hairs, the sockets of these represented by microscopic pits, this particularly noticeable on the dorsal surfaces of the caudal femora. Femora with ventral margins unarmed, except ventro-caudal margins of caudal femora, which are unarmed or with one (one to three in the series) spine. Genicular lobes unarmed (occasionally with a minute spine on caudal lobe of median femora in the series, and in one paratype with an even smaller spine on a cephalic lobe of the cephalic femora). Cephalic tibiae with dorsal surface armed with three spines along the caudal margin.[23] Caudal tibiae with distal spurs as described for *inyo*, except that they are not as elongate, the longest more generally curved. Plantula about one-third as long as metatarsus.

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[22] Slight variation occurs, as is shown by the paratypes, in which the distal projection varies from slightly larger to slightly smaller than the marginal projection.

General coloration sayal brown.[24] Head uniformly of this color, microscopically mottled with blackish, except for a broad postocular band of black on each side. Pronotum with disk uniform warm sepia, margined laterad[25] with black,[26] which dark area expands caudad and fills the entire area of the produced portion of the lateral lobes to the convex callosities, which are white.[27] Tegmina ochraceous-buff, the portion proximad of the tympanum tinged with blackish. Dorsal surface of abdomen verona brown, deepening through warm sepia to chestnut brown, the darker areas represented by a broadly V-shaped marking mesad on each segment and lateral suffusions, the internal margins of which are oblique. Limbs sayal brown. Cephalic and median femora with a broad black area dorsad near the distal extremity. Cephalic tibia darkened in foraminal area. Caudal femora with a black area, twice as long as broad, dorso-proximad, and a black band of equal width running on the inner face from the median section of the enlarged portion to the extremity of that portion, where it curves dorsad, running over the dorsal face and half way down the external face.[28]

In the immature example the dark caudal femoral markings are confined to the dorso-proximal section, and a broad suffused blackish longitudinal band on the external face below the median line.

The measurements of the type are given first, followed by the extremes found in three paratypic males. Length of body, 19.5 mm., 13.7 to 17; length of pronotum, 4.4, 3.9 to 4.2; greatest width of pronotal disk, 3.2, 2.9–3.1; total width of pronotum, 4.3, 3.9 to 4.1; exposed length of tegmen, 4.4, 3.6 to 3.9; length of caudal femur, 14.7, 12.2 to 14 mm.

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[23] In the type and the immature example at hand the median spine is missing on one of these margins.

[24] Individually varying to warm sepia.

[25] This shows the discal area to be of the same shape as in *Idionotus brunneus* Scudder, in which species the discal area is defined by lateral carinae throughout.

[26] Individually varying from a narrow line proximad to a suffusion covering half of the lateral lobes.

[27] Individually varying to warm sepia.

[28] In some specimens thence extending proximad on the external face as two suffused black lines.

In addition to the type, we have before us three paratypic males, bearing the same data, except that one was taken September 5, 1919. A small immature male is also at hand, taken near the upper meadows on Whitney Pass Trail, at an elevation of 10,700 feet, on September 6, 1919, by M. Hebard, near some small shrubs growing on a narrow slope of decomposed granite, at the foot of a twenty-seven hundred foot, south-facing precipice.

The typical series was taken in the open on steep decomposed granite sand slopes, overgrown with much sage and low thorny bushes. From the above data the species is found to range from the middle of the Western Yellow Pine (*Pinus ponderosa jeffreyi*) zone upward to near timber line in the zone of the Foxtail and Lodgepole Pines (*Pinus balfouriana* and *murrayana*).

ACRODECTES[29] new genus

This genus has no known close affinities. The character of the development leads us, however, to place it in linear arrangement immediately after *Idiostatus* Pictet. From that genus it is separated by the form of the vertex, which shows a distal depression, of the pronotum, which has a distinct transverse wrinkling and is less produced and in the male sex is slightly raised caudad,[30] the more fully exposed tegmina in both sexes, which show a different type of reduction, in the strong medio-longitudinal carina of the dorsal surface of the abdomen, the different general type of male genitalic development, in the ovipositor being non-serrate distad and the even greater reduction in the length of the distal spurs of the caudal tibiae, particularly of the median pair.

The genus is monotypic. Genotype.—*Acrodectes philopagus* here described.

Generic Description.—Size medium for the Decticinae, form elongate but robust, surface shining. Head with vertex rather broad, narrowing very weakly to the fastigio-facial suture, showing a slight depression on its surface dorso-distad. Pronotum short, with disk rounding evenly into the lateral lobes, except at the distinct latero-caudal shoulders, the surface transversely wrinkled, except in brief caudal produced portion; lateral lobes longer than deep, humeral sinus subobsolete, convex callosities obsolete. Tegmina reduced, the immediate base alone concealed by the pronotum in both sexes; in the male with entire stridulating field exposed. Dorsal surface of abdomen with a strong medio-longitudinal carina, this broken on the distal tergites. Male penultimate tergite specialized. Male cerci large and heavy with an internal tooth. Female with ovipositor elongate, almost straight, showing a very weak upward trend, smooth and polished except dorsal margin distad, which is very feebly furrowed with irregular oblique ridges; apex acute, median. Female subgenital plate simple. Prosternum unarmed. Limbs short and heavy. Cephalic coxae armed with a heavy spine. Femora with ventral margins armed with minute but stout spines. Cephalic tibiae with dorsal surface armed along external margin with three, sometimes four, stout spines. Caudal tibiae armed distad with three pairs of short heavy spurs, of which the dorsal pair are approximately as long as the heavier median pair. Plantula very small, scarcely longer than broad, about one-fourth the length of the metatarsus.

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[29] From ἄκρα = summit and δηκτης = a biter.

[30] In this feature some resemblance to the type developed in *Metrioptera sphagnorum* (Walker) is shown.

The character of the specialization of the male genitalia is distinctive among the Decticinae.

Acrodectes philopagus[31] new species (Pl. XI, figs. 1, 2, 3, 4, 5, 6 and 7.)

In addition to the numerous structural features which separate this remarkable insect from all other known forms of the Decticinae, the unusual black and tan type of coloration readily serves to distinguish the species.

Restricted in distribution to the bleak crags and rock piles, above timber line in the High Sierras, this species is of unusual interest to the student of biological development under as severe conditions as can be found in the United States.

Type—♂; Mount Whitney, Sierra Nevada, Fresno County, California. Elevation, 13,800 to 14,200 feet. September 7, 1919. (M. Hebard.) [Hebard Collection, Type no. 551.]

In addition to the features given in the generic description, we would note the following:

Size smaller than that of *Idiostatus hermanii* (Thomas). Head with vertex slightly wider than proximal antennal joint. Pronotum with latero-caudal shoulders of disk broadly rounded, the metazona moderately inflated caudad, so that the caudal margin is evenly convex in caudal aspect, caudal margin in dorsal aspect weakly concave. Tegmina, due to the brief production of the pronotum caudad and its convexity in that portion, fully exposed, approximately one and one-half times as long as the pronotum, stridulating field large, the tegmina beyond this point produced in latero-external portion, this area being longer than its proximal width, with margins converging to the very broadly rounded apex, in length less than that of the proximal section of the tegmina,[32] furnished with a coarse, irregular network of veins, among which the discoidal vein is heavier and direct, the median vein irregular and no heavier than the irregular cross-veins.

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[31] From φιλο-πάγος = a lover of the icy crags.

Penultimate tergite slightly more produced than preceding tergites, with a rather broad, percurrent, medio-longitudinal cleft, the cleft thus dividing this tergite into two similar sections which are movable, the cleft filled in its proximal two-thirds with a soft connecting integument, the distal margin of tergite transverse to the cleft. Supra-anal plate beneath deflexed between the cercal bases, short, shield-shaped with apex rounded. Cerci very large and heavy, straight, tapering very slightly to the heavy rounded apex, armed internally mesad with a very heavy erect tooth, two-thirds as long as remaining distal portion of cercus, vertical to shaft but with heavy apical spine curved slightly proximad, this tooth with proximal face armed with a number[33] of stout erect teeth, the internal surface of the shaft of the cerci, from this point proximad, deplanate with dorsal and ventral margins slightly raised and broadly rounded. Titillator represented by two similar processes, directed dorso-distad from the soft integument of the anal chamber, each chitinous, shaped like the blade of a short pen-knife, with edge dorsad armed with minute curved teeth. Subgenital plate with two rounded parallel carinae distad, the large styles situated in sockets at the apices of these, the distal portion of the free margin between rectangulate emarginate with apex rounded. Styles five times as long as proximal width, about two-thirds as long as the distance between their bases, straight, tapering slightly to the rounded apex.

Ventral margins of femora armed.[34] Genicular lobe very frequently supplied with a single minute spine[35] except the caudal genicular lobe of the cephalic femora which, apparently, is never armed. Caudal tibiae armed distad with three pairs of short heavy spurs, of which the longest is about half as long as the matatarsus.

Allotype—♀; same data as type, except that it was taken at 13,200 feet. [Hebard Collection.]

Agrees closely with male, except in the following features. Pronotum not inflated caudad, latero-caudal shoulders slightly more sharply rounded. Tegmina represented by elongate, lateral, rotundato-trigonal pads, in length slightly greater than that of pronotum, slightly over half as wide as long, the sutural margin oblique from point of greatest width to the rather broadly rounded apex; the venation represented by a coarse irregular network, in which the six principal veins, and particularly the discoidal (though somewhat irregular), are apparent. Medio-longitudinal carina of dorsal surface of abdomen decidedly weaker and interrupted in broader intervals distad than in male. Penultimate tergite much less ample and a much weaker development of the same type as found in that sex, the medio-longitudinal division being indicated only by a depression. Cerci small, elongate conical, slightly upcurved. Ovipositor much longer than caudal femur, showing a very faint upward curvature, apices of valves acute, median in position. Subgenital plate simple, convex, lateral margins strongly convex to meso-distal portion. the margin there deeply concave, the lateral apices thus formed broadly rounded.

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[32] Varying in paratypes to very slightly longer than proximal section.

[33] Twelve or more.

[34] See details after table of measurements.

[35] In two examples a single genicular lobe bears two minute spines.

General coloration shining black with conspicuous areas of reddish brown. Male type with head black, the face suffused with buckthorn brown. Pronotum black, with metanotum russet. Tegmina immaculate russet. Abdomen dorsad black, the caudal margin of the penultimate segment and internal surfaces of the cerci russet. Ventral surface of abdomen mars brown. Limbs with coxae and proximal half of femora black, remaining portions buckthorn brown, tinged with tawny distad, except foramina of cephalic tibiae which are black and feet which are suffused with blackish.

The female allotype is in every way similar except that the paler markings are all russet, the ovipositor alone shading to ochraceous-tawny proximad, the subgenital plate black, tawny meso-distad.

The series shows various degrees of recession in coloration. Two have the metanotum tawny, this running through the disk on the prozona and mesozona laterad of the median line. The tergites are each broadly margined caudad with tawny, the tips of the cerci entirely tawny and the black of the femora receding to the proximal two-fifths. In these the entire face is pale buckthorn brown to the caudal portions of the genae. while the subgenital plate is cinnamon brown.

Two other males show more decided recession, as follows. Occiput and lateral lobes of pronotum blackish carob brown (the former paler in one, cinnamon brown mesad), face clay color, remaining portions of pronotum cinnamon-brown shading to buckthorn brown caudad. Tegmina cinnamon-brown, abdomen dorsad buckthorn brown, finely tessellate with blackish, cerci buckthorn. Limbs buckthorn brown, with proximal portions of femora marked with black, this very weak on cephalic femora.

The immature individuals at hand agree fully in coloration with the intensively colored adults.

Measurements (in millimeters)

	Length of body	Length of pronotum	Caudal width of pronotal disk	Length of tegmen	Length of caudal femur
♂					
Mt. Whitney, California, *type*....................	22.8	4.7	1.3	7.8	12.2

	Length of body	Length of pronotum	Caudal width of pronotal disk	Length of tegmen	Length of caudal femur
Mt. Whitney, California, *paratypes*	20.2–24.4	4.2–5	4–4.8	6.6–8.6	11.7–12.4
Mono Pass, California	24	5	5.1	7.7	12.3
♀					
Mt. Whitney, California, *allotype*	21.7	5	4.1	6.5	13.7

The length of the ovipositor of the allotype is 18 mm.

The armament of spines of the ventral femoral margins is as follows, that for the type given first, followed by the extremes for the series. Cephalic femur, ventro-cephalic 3 and 5, 3 to 6; ventro-caudal 1 and 3, 0 to 3; median femur, ventro-cephalic 3 and 3, 1 to 6; ventro-caudal 1 and 2, 0 to 4; caudal femur, ventro-external 4 and 7, 1 to 8; ventro-internal 3 and 5, 2 to 10.

In addition to the described pair, five adult males are before us, bearing the same data, except that one was taken on the southwestern slope of Mount Muir (a spur of Whitney Ridge) at 13,100 feet, and one at the highest point in the United States, the summit of Mount Whitney, 14,500 feet. These we designate as paratypes.

We have, moreover, a pale colored adult male, taken at Mono Pass, California, at 10,600 feet; a third grown immature male from the summit of Mount Whitney, taken on August 12, 1908; a nearly adult female taken on the Kern-Kaweah Divide, Tulare County, California, at 12,000 feet, on July 12, 1910, by W. Colby, and one smaller immature female taken on Mount Rixford Ridge, Fresno County, California, at 12,000 feet, on August 12, 1914, by F. Grinnell, Jr. Of this series, all are in the Philadelphia Collections except the first mentioned immature male and female, which are the property of the California Academy of Sciences. All of the localities are in the southern Sierra Nevada Mountains.

The following field notes were made. "These remarkable insects live among the granite boulders and slabs, where there is no vegatation whatever, except small quantities of blackish lichens. With the lichens they harmonize, but a few looked conspicuously black on the grayish granite where they were found. Some were found on the decomposed granite sand in chinks of the enormous rock slides, while frequently males were perched on the upper edge of granite boulders, stridulating in the sunlight. A high and very cold wind was blowing and their bodies were stone cold. The males, however, stridulated vigorously—dzit-zit dzit-zit dzit-zit—a harsh and nervous sounding note, which was discontinued instantly if one approaching was heard or seen, no matter if twenty feet away. The males, when they thus discontinued stridulating, however, were easily taken, as they would remain motionless until suddenly seized, if the hand approached with caution after a reasonably careful advance had been made. Individuals not stridulating were alert and would at once make for some crack under a granite boulder, by clumsy and short but hurried leaps. The species was found in small numbers on the southwestern slope of Mount Whitney at 13,800 to 14,200 feet, elsewhere it was very scarce."

EXPLANATION OF PLATES

Plate VIII

Fig. 1.—*Aglaothorax segnis* new species. Crestline, Nevada. Male. *Type.* Dorsal view of pronotum. (×2.)

Fig. 2.—*Aglaothorax armiger* new species. Lee Canyon, Spring Mountains, Nevada. Male. *Type.* Dorsal view of pronotum. (×2.)

Fig. 3.—*Aglaothorax segnis* new species. Crestline, Nevada. Male. *Type.* Cercus (from dorsum). (Greatly enlarged.)

Fig. 4.—*Aglaothorax armiger* new species. Lee Canyon, Spring Mountains, Nevada. Male. *Type.* Dorsal view of apex of abdomen. (Greatly enlarged.)

Fig. 5.—*Rehnia cerberus* new species. Marathon, Texas. Male. *Type.* Stridulating field of left tegmen. (×4.)

Fig. 6.—*Rehnia sinaloae* new species. Venvidio, Sinaloa, Mexico. Male. *Type.* Stridulating field of left tegmen. (×4.)

Fig. 7.—*Rehnia cerberus* new species. Marathon, Texas. Male. *Type.* Dorsal view of apex of abdomen. (Greatly enlarged.)

Fig. 8.—*Rehnia sinaloae* new species. Venvidio, Sinaloa, Mexico. Male. *Type.* Dorsal view of apex of abdomen. (Greatly enlarged.)

Plate IX

Fig. 1.—*Aglaothorax segnis* new species. Crestline, Nevada. Male. *Type.* Lateral outline of pronotum. (×2.)

Fig. 2.—*Aglaothorax armiger* new species. Lee Canyon, Spring Mountains, Nevada. Male. *Type.* Lateral outline of pronotum. (×2.)

Fig. 3.—*Aglaothorax armiger* new species. Lee Canyon, Spring Mountains, Nevada. Female. *Allotype.* Lateral outline of ovipositor and subgenital plate. (×2¼.)

Fig. 4.—*Rehnia cerberus* new species. Marathon, Texas. Male. *Type.* Lateral view of pronotum. (×3.)

Fig. 5.—*Rehnia sinaloae* new species. Venvidio, Sinaloa, Mexico. Male. *Type.* Lateral view of pronotum. (×2.)

Fig. 6.—*Rehnia cerberus* new species. Female. *Allotype.* Lateral outline of ovipositor. (×1½.)

Fig. 7.—*Rehnia sinaloae* new species. Venvidio, Sinaloa, Mexico. Female. *Allotype.* Lateral outline of ovipositor. (×1½.)

Fig. 8.—*Pediodectes daedalus* new species. Uvalde, Texas. Male. *Type.* Dorsal view of penultimate tergite. (Greatly enlarged.)

Fig. 9.—Same. Dorsal view of cercus. (Greatly enlarged.)

Fig. 10.—*Pediodectes daedalus* new species. Uvalde, Texas. Female. *Allotype.* Lateral view of ovipositor. (×1½.)

Fig. 11.—Same. Lateral view of distal portion of ovipositor. (Greatly enlarged.)

Fig. 12.—*Anabrus spokan* new species. Sand Point, Idaho. Male. *Type.* Dorsal view of cercus. (Greatly enlarged.)

Fig. 13.—Same. Dorsal outline of pronotum. (×2.)

Fig. 14.—Same. Lateral outline of pronotum. (×2.)

Fig. 15.—*Anabrus spokan* new species. Sand Point, Idaho. Female. *Allotype.* Lateral view of ovipositor. (×1½.)

Plate X

Fig. 1.—*Oreopedes cryptoptera* new species. Silver Canyon Trail, White Mountains, Inyo County, California. 8200 to 8300 feet. Male. *Type.* Dorsal outline of pronotum. (×2.)

Fig. 2.—Same. Lateral outline of pronotum. (×2.)

Fig. 3.—Same. Dorsal view of penultimate tergite. (Greatly enlarged.)

Fig. 4.—Same. Dorsal view of cercus. (Greatly enlarged.)

Fig. 5.—Same. Lateral view of disto-external portion of caudal tibia. (Greatly enlarged.)

Fig. 6.—*Idiostatus inyo* new species. Near Owen's Lake, Inyo County, California. Male. *Type.* Lateral view of pronotum and tegmen. (×4.)

Fig. 7.—Same. Dorsal view of penultimate tergite. (Greatly enlarged.)

Fig. 8.—Same. Dorsal view of cercus. (Greatly enlarged.)

Fig. 9.—*Idiostatus callimera* new species. Lone Pine Canyon, Sierra Nevada Mountains, Inyo County, California. 8400 feet. Male. *Type.* Lateral outline of pronotum. (×2.)

Fig. 10.—Same. Dorsal view of pronotum and tegmina. (×4.)

Fig. 11.—Same. Dorsal view of penultimate tergite and supra-anal plate. (Greatly enlarged.)

Fig. 12.—Same. Dorsal view of cercus. (Greatly enlarged.)

The supra-anal plate is visible from above in this species, as shown. It is concealed from this aspect in *Oreopedes cryptoptera* and *Idiostatus inyo.*

Plate XI

Fig. 1.—*Acrodectes philopagus* new species. Mount Whitney, California. 13,800 to 14,200 feet. Male. *Type.* Lateral view. (×3.)

Fig. 2.—Same. Dorsal view of penultimate tergite. (Greatly enlarged.)

Fig. 3.—Same. Dorsal view of cercus. (Greatly enlarged.)

Fig. 4.—Same. Dorsal view of pronotum and tegmina. (×4.)

Fig. 5.—*Acrodectes philopagus* new species. Mount Whitney, California. 13,200 feet. Female. *Allotype.* Lateral view of ovipositor. (×2.)

Fig. 6.—Same. Dorsal view of pronotum and tegmina. (×4.)

Fig. 7.—Same. Lateral view of distal partion of ovipositor. (Greatly enlarged.)